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Author

AN ESSAY

ON

CONTAGIONS & INFECTIONS;

AND

THEIR LAWS OF GENERATION & COMMUNICATION,

BY WHICH

They are respectively governed, and thence properly to be distinguished.

DESIGNED,

As the continuation of the remarks, in an "Essay, on the Prevailing Fever of 1817."

TOGETHER WITH

A Syllabus, and Classification, with practical remarks on the origin of CONTAGIONS and INFECTIONS.

TO WHICH,

Are added, HINTS and DIRECTIONS, to the best means for preventing the extension of CONTAGIOUS & INFECTIOUS DISEASES.

~~~~~  
By J. L. E. W. SHECUT, Physician;

Member of the Literary and Philosophical Society of S. Carolina,  
Author of FLORA CAROLINIENSIS, &c. &c.

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1818.

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## ADVERTISEMENT.

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*This Essay was prepared for the Press, immediately after the Publication of that, on the Prevaling, or Yellow Fever of 1817; and designed, not only to point out the errors, which have obtained, among the advocates for the Contagiousness of Yellow Fever, in our own Country: But also, to invite a candid and impartial investigation of the subject, among the learned Practitioners of Europe and elsewhere; who have been carried away from the truth; merely, for the want of attending to those marks which distinguish Contagions from Infections, and the Laws of Generation, and of Communication, by which they are respectively governed.*

*The subject, being one of acknowledged importance to mankind generally, and to our Country particularly, an apology for its publication, is considered superfluous. It may be necessary, however, to observe, that owing to unforeseen delays, in procuring a new set of Type; its publication has been prevented, until upwards of ten months have elapsed since it was ready for the Press.*

*From this delay however, two advantages have been gained to the Author; and to his Readers — 1. He has had further proofs of the correctness of his Doctrine, of the Causes of the Yellow Fever of Charleston.—From the circumstances of the present year, 1818, which, although it has been uncommonly dry and hot, yet there has existed, no Epidemic Yellow Fever! and only three or four Cases of Anomalous or Sporadic Yellow Fever. But why?—Surely hot and dry, and hot and moist*

Summers, are nearly alike favorable to the generation and extension of Yellow Fever influence?—True, but that is, when there does not exist, an ELECTRICAL EQUILIBRIUM in the Air, and over the face of the Earth. Now, happily for our City, this Equilibrium did exist, with little variation, from the 1st of March, to the 9th of September; on which day, the Equilibrium appeared to be deranged.—It thundered 30 days from the 1st of March to the 27th August, some of which concussions were very severe; particularly on the 2nd May, 31st do. 14th and 16th June, and that of the 3rd of July. On the 18th of September the Electrical Equilibrium began again to exist, and operations on the Electrical Apparatus, have been undisturbed.—It was during this want of Electrical influence in the Atmosphere of our City, that these Sporadic cases of the Fever occurred.—Since the restoration of the Equilibrium, we have had no more cases of it. And I am led to believe, that while it does exist; it is impossible for the gaseous poison or Yellow Fever influence to exist in that degree that is capable of producing the Epidemic Yellow Fever.—2. I trust, that the learned Practitioners of Europe and America, from a candid investigation of these, and similar facts; that are respectfully submitted to their consideration, will easily detect the fallacy of the Doctrine, of the Contagious nature of the Yellow Fever; and that disease, being proved, to be an Infectious one (according to the doctrine contained in these Essays;) and not Contagious, will no longer subject our city to the fear, or the terrors of Foreigners, and to the injurious effects that such a belief has, upon our Commerce, our Wealth and our Population.



## DEDICATION.



To Colonel *DANIEL STEVENS*, Chairman;

And the Gentlemen composing the *Board of Health*, of the City of Charleston.

GENTLEMEN,

*A regard for the deep interest, which you have jointly, and severally evidenced in the cause of humanity, during the calamitous Season of the last year, together with your unwearied zeal, in recommending, and personal exertions, in exercising the means of prevention, at the risk of your healths and lives; deserves from your Fellow Citizens, and especially the Strangers, in whose immediate behalf, your services have been so cheerfully rendered, the warmest admiration and praise.*

*As a testimony of the high sense, I entertain of your Philanthropic zeal; and the very great respect I have for you, as a body, and individually as Fellow Citizens, I pray you to accept this Essay as a small tribute to your Philanthropy; and with it the esteem, and regard, of Gentlemen, yours truly,*

THE AUTHOR.

Charleston, December, 1817.



TO  
Samuel L. Mitchell, M. D.

PROFESSOR OF NATURAL HISTORY, &c.

IN THE UNIVERSITY OF NEW-YORK.

SIR,

*With the following Sheets, you will be  
pleased to accept the esteem and regard; which  
your Character as a Philosopher and Patron of  
Science, has so justly acquired for you, at home  
and abroad; but no where, and in none more  
sincerely, than in the bosom of, my dear Sir, your  
obliged and obedient Servant,*

*The Author.*

Charleston, December, 1817.



TO  
DAVID HOSACK, M. D.  
F. R. S. L & E. F. L. S.

PROFESSOR OF THE THEORY AND PRACTICE OF PHYSIC, AND  
MIDWIFERY,

IN THE UNIVERSITY OF NEW-YORK, &c. &c.

SIR,

*The following Sheets owe their origin to the very interesting, and truly Scientific Correspondence, between yourself and DR. CHISOLM, on the subject of Contagions and Infections; and have been enlarged, from notes, which I had taken, on perusing your Letters to the Doctor on this important subject.*

*I could not, therefore, introduce this Essay to the world, without acknowledging, how much I am indebted to your deep research, and profound judgment, in that Science, in which you occupy such a conspicuous and deserved elevation: Nor could I, consistently, with the esteem and regard, I entertain for you, as a friend, forego the pleasure, of renewing to you, the assurance of the high respect, of dear Sir, yours truly and sincerely,*

*The Author.*

Charleston, December, 1817.

terms *Fomites*; that is, the matters thus secreted; either in the form of sweat, saliva, blood, or pus, or even the breath of the diseased, and confined in the beds (or blankets) or other articles of apparel; are also capable of reproducing the same specific disease, as that from which it originated—while it is to be remarked, that *infections* are only generated by the decomposition of putrid animal, or vegetable substances, or of both combined; hence, they are the result of the process of putrefaction of *dead bodies*, animal or vegetable; and not of “*organized living animal bodies*” of which, I shall say more in the next chapter.

*Contagions* when once generated, are thence communicable only by *contact or the touch, with the absorption of the virus*. And this law of communication constitutes a class of *Contagions*, which I consider as *original and primary*, and whose term is derived from the Latin *contagio* or *contagium*, from *contingo* and *contactus* to come in contact or to touch.

But there is another class of *Contagions*, that along with the foregoing, have an additional power and hence a *second law of Communication*, which belongs not to the first class. By this second law of Communication, this class of *Contagions*, are capable of generating within certain limits, an atmosphere, possessing the property of exciting the same specific disease; that the diseased body would generate, by coming in contact, or touching persons, not diseased. And, this *contagious atmosphere*, possesses the peculiar power of exciting, or producing the same disease, from which it originated; by both laws of communication, and that *ad infinitum*; and under all circumstances of the wea-

ther; either summer or winter, or pure or impure air.

A third law of communication peculiar to all the *contagions*, is, that they are capable of being excited, or re-produced by means of their *Fomites*, or the matter of contagion, as already observed; and which have been imbibed, and held suspended as it were, in different articles of clothing, or bedding, and afterwards being brought in contact, or even the close approach, that is, to within the spheres of their influence, excite disease of the same character, with that of the *original* contagion, and that too, *ad infinitum*.

DR. CULLEN, treating of the remote causes of fever, observes, "As fevers are so generally epidemic, it is probable, that some matter floating in the atmosphere, and applied to the bodies of men, ought to be considered as the remote cause of fevers; and these matters present in the atmosphere; and thus acting upon men, may be considered, either as *contagions*, that is, effluvia arising directly, or originally, from the body of a man, under a particular disease; and exciting the same kind of disease in the body, to whom they are applied; or *miasmata*, that is, effluvia arising from other substances than the bodies of men, producing a disease in the person, to whom they are applied.\*

*Fevers*, as will be shewn in the next chapter, almost invariably originate from *infections*, by which, I mean original and primary fevers. The above paragraph will, therefore, apply only, (as it regards the contagious effluvia, arising from the bodies of men,) to the *exanthemata*; while those

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\* Practice of Physic, Vol. I, Parag. LXXVIII.



which arise in consequence of other substances, than the bodies of men, will properly apply to the *Pyrexia* and *Febrès*, of his classification. In his **LXXXII** paragraph, we perceive the subject yet more clearly, and distinctly defined: "With respect to these *contagions*, though we have spoken of them as matters floating in the atmosphere, it is proper to observe, that they are never found to act, but when they are near to the sources from which they arise, that is, either near to the bodies of men, from which they immediately issue, or near to some substances which, as having been near to the bodies of men, are imbued with their effluvia; and in which substances these effluvia are sometimes retained in an active state for a very long time."

"The substances thus imbued with an active and infectious matter may be called *Fomites*, and it appears to me probable, that *contagions* as they arise from *Fomites* are more powerful, than as they arise immediately from the human body."

The diseases that may be properly considered as constituting the *first class of contagions* have been arranged by Professor HOSACK as follows,

"The *Itch*, the *Syphilis*, the *Sibbens* of Scotland, the *Laanda* of Africa, the *Yaws*, the *Leprosy*, *Hydrophobia* & the *Vaccine Virus*."\* To this class also I would add *Phthisis Pulmonalis*. DR. RUSH otherwise disposed to reject it, admits, that it is *contagious*, by means of the breath from patients, whose lungs are ulcerated, and by the hectic sweat becoming putrid, by stagnating in the sheets or blankets. Persons sleeping any length of time in the same bed

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\* Letter of Dr. Chisolm, on *Contagions*.



with a patient in confined phthisis, is almost sure to contract the disease. The contagions of these diseases, may be also, very properly termed *fixed* or *indolent*, since they have not the power of communicating disease by any other means, than *actual bodily contact*, or by means of their *Fomites* conveyed, or transported in clothing, or other substances, capable of absorbing and retaining the fluid, or matters thus secreted; and holding them thus in an active state for a long time.

As a proof of this, it is well known that the *Itch* has been kept in circulation for years, along with the circulation of filthy ragged paper-money. It is frequently communicated by shaking hands, and by means of bed clothes, wearing apparel and especially gloves; in all these cases, it has been communicated by *actual contact*, either personally or by means of some substances retaining the matter of the contagion (some say *animalculæ*.) But it has not, nor has any of the diseases of this class, ever been communicated through the medium of the atmosphere, and hence they are strictly and properly fixed contagions.

The *Sibbens*, a term given in the west of Scotland to the venereal disease, and *Syphilis*, the term, by which it is almost universally recognized in all other parts of the civilized world, are known to be communicated from diseased children to the nipples, and breasts of nurses, and again, from diseased nurses to sucking infants. It may be also contracted by using the same bed-vessel, recently occupied by a diseased person. And here, it is to be particularly remarked, that to be communicated this way, the *virus* is supposed to be deposited on, or near the edges of the bed-vessel; which being shortly after

occupied by another person, the thinly defended parts, which sometimes come in contact with the matter thus deposited, take it up, and being absorbed, the disease is readily excited. It is also more readily communicated in the form of *Chancres*, seated on the lips, by kissing, &c.

With regard to the *Launda* of Africa, and the *Yaws*, I am not qualified, from any remarks in my possession, to say any thing specific: But from a close investigation of the characters of those diseases which belong to the first class of *contagions*, there can be but little doubt, that they are among such, as were considered *unclean* among the ancients, and are probably nothing more, than so many modifications of the *Leprosy* of the Jews, mentioned in the Holy Scriptures.

Authors distinguish between the *Leprosy* of the *Greeks* and that of the *Arabians*. The former is said to be more superficially seated than the latter, and produce little white *eschars*, like bran or fish scales all over the body. They are accompanied with intense itching, redness of the eyes, offensive breath, a swelling of the hands, fingers and feet; but sometimes universal.\* The latter, or *Arabian leprosy* consists of a general *cachexy* and emaciation in which, the veins of the legs are varicose in their whole course, and one, or both legs, swell by degrees to a most enormous size, the skin being thickened, rough, scaly and chapped, resembling strongly the leg of an Elephant, from which circumstance the disease has been termed *Elephantiasis*; of which SAUVAGES describes from PROSPER ALPINUS, GILBERT and others, nine different species.†

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\* Shaw's Practice, Part 4, Sec. XIX.

† SAUVAGES Nosolog. Meth. Tom. II.

**DR. DANCER** has given us the history of a disease, that is common to the blacks, and sometimes even to the white inhabitants of the West Indies, which is termed *Coco-Bay* or the *Joint Evil*; others, term it the *Red disease of Guiana*.<sup>\*</sup> It is obvious, from the symptoms of this disease as particularly described by **HILARY**, and **HEBERDEN** that it is one of the species of *Elephantiasis* described by **PROSPER ALPINUS** in the nosological arrangement of **SAUVAGE**. This loathsome disease, commences, “with copper coloured spots on the skin, and tuberculous swellings of the lobes of the ears, a falling off of the hairs of the eye brows, enlargement of the nostrils, and lips; distortion of the fingers, and toes; which ulcerate, and drop off joint by joint”.—It appears, that this disease also, is sometimes accompanied with tubercles, fissures, and ulcerations of the legs, which swell to a great size as in the true *Elephantiasis*. It is also common to *Africa*, the East as well as West Indies, and to *Egypt*, where it is termed *Lævia*. It is considered highly contagious, and is also said to be hereditary.—In some places, as at *Carthagene*,<sup>†</sup> the diseased are separated from the rest of the community, and are called *Lazars*. It is however principally hereditary in the male line; according to **HUGHES**, the children of leprous fathers being affected by it, while the mothers are perfectly free. The lasciviousness of these unhappy creatures, as related by **SONINI** and **ULLOA**, says **DR. DANCER**, is shocking even to polluted ears.<sup>‡</sup> From the foregoing view of *original and primary contagions*; it will

<sup>\*</sup> Jamaica Pract. Chap. IX. Page 232.

<sup>†</sup> Ulloa's Voyages and Captain Riley's Narrative, Page 191.

<sup>‡</sup> Jamaica Practice, Chap. IX. Page 233.

appear, that the *Elephantiasis*, or Arabian leprosy, with all its species, as also the *Yaws* and *Syphilis* may be considered as forming the highest grade of *contagious or unclean diseases*; while *scabies*, *linea capitis*, the *leprosy of the Greeks*, the *cracraw* of the Africans, *tetters* and the *itch*, as forming the lowest grade, of indolent and fixed contagions, and come very properly within the denomination of the *unclean diseases* spoken of in the scriptures.

The second class of *contagious diseases*, according to DR. HOSACK, in his division of contagions and infections, are as follows: *Small pox*, *measles*, *chicken pox*, *influenza*, *whooping cough*, *scarlet-fever*, and *cynanche maligna*. For reasons which I shall shortly assign, I propose to separate the *influenza* from *contagious*, and place it among the *infectious diseases*.

To this class of contagions, I have for some years had my doubts, whether to add the *plague*, or *pestis* of Europe, believing it to be an infectious rather than a contagious disease. From the perusal of DR. DUCACHET's learned essay on the action of poisons,\* the following facts appear so conclusive, that they have occasioned me some doubts with regard to the correctness of my former opinion, "that *plague* may be produced by inoculation, with the matter of a pestilential bubo, is a fact, he says, established by evidence, which cannot be resisted. And that the bile, and the blood, will also communicate the disease, rests on testimony equally sure, DR. DESGENETTES distinctly and unequivocally declared in a personal interview with

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\* Inaugural Essay, &c. Page 76.



DR. FRANCIS, his conviction of the contagious nature of the plague : and Sir GILBERT BLANE, and Sir JAMES MCGREGOR, have assured him, that the accuracy of the statement of DR. WHYTE'S inoculation and consequent death, might implicitly be depended upon."

Upon this authority, therefore, but at the same time with the most respectful deference to the opinion of *Professor HOSACK*, I have considered the *plague* or *pestis orientalis*, as proper to be referred to this second class of contagions.

There are certain animal poisons, that are considered by some phisiologists as *contagions*; these are "the poisonous humours that are produced from the *healthy action* of the vessels, as those of the *Rattle Snake*, *Viper*, and *Spider*. If these are to be admitted as contagions, we see no reasons why the poisons of all the venomous beasts, reptiles, fishes and insects, as also, the vegetable and mineral poisons, may not be added as so many *minor contagions* since it is certain, that every specific poison, has its peculiar or sepcific effect upon the animal economy.—

Why I do not consider these poisons as proper to be classed among *contagions*, is, that neither of them, after having produced disease in the animal economy, are capable of reproducing a disease like to that which it produced; by any of the known laws that govern the communication of contagions; for instance, if a rattle snake, a viper, or a spider inflict their wound in any animal, it is beyond controversy true, that the disease produced, in consequence of their poison in any such animal, is not, nor as far as I have been able to ascertain, cannot communicate the same specific disease to

any other animal, which may come in contact with the diseased, and hence they should be considered as they really are, nothing more than animal poisons.—

I cannot, however, take leave of this subject, without saying something on the remarkable properties of certain snakes, and especially of the *crotalus horridus*, or rattle snake of America, in charming or fascinating, squirrels, birds, &c. If this power is attempted to be denied, it would be calling in question the veracity of some of the most learned, and respectable persons who have asserted it. *Professor ROBERT PATTERSON* of the University of Pennsylvania, in his biographical notes on the Rev. and pious *Dr. JOHN EWING*, Provost of the university, observes, '*Dr. EWING* has been heard to state a fact, which he witnessed at this period of his life, and which I cannot resist relating, since, established by his character for veracity, it may shed some light on a question in natural history, hitherto involved in some obscurity. As he went to his school one morning, at an early hour, he observed a bird in extreme agitation, flying repeatedly across the road, but never going beyond the fence, on either side, on which it constantly alighted; it would rest there for a moment, and then return to the opposite fence, always descending in its flight, until it nearly touched the ground. Its agitation arrested his attention, and he stood to observe the cause. On the spot where it seemed disposed to alight, in its flight, he observed a snake, which had evidently fixed on its victim, and fascinated it beyond the power of escaping by its own efforts. He frightened the snake away by throwing at it a stone; when the

bird instantly flew off with evident symptoms of joy.”\*

I have conversed with several gentlemen of known veracity, who have assured me that they have seen instances, in which this fascinating power influenced persons, grown to maturity; and that they were found almost prostrate; and appeared to be in the act of attempting, (if the thing itself had been practicable) to crawl voluntarily into the mouths of the serpents. Two of the cases, related, were adults; and the third a boy of four years of age. And, indeed, I have heard so many well attested accounts of similar facts, during the twelve years that I practised in the interior of this state; that I am perfectly convinced of this property, and it only remains to be accounted for upon rational principles.

SIR HANS SLOANE is of opinion, that the snake first inflicts a wound in the animal, or bird, which he designs to ensnare.† But this opinion is erroneous, for it is well known that the rattle snake never bites any thing which he designs for food; but it is by the fascinating power, that they are enabled so to intamate small animals and birds, that they eventually crawl down the throats of these serpents, who all the while lay as quiet as possible, and with their hungry jaws wide extended for the reception of their prey. I believe that it has been considered impossible for these reptiles to bite any thing, without, at the same time emitting their poison, which is contained in a bag at the root of the fangs, or hollow curved teeth, with which they inflict

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\* Ewings Nat. Philos. by Dr. Patterson.

† See Wesley's Philosophy Vol. I.

their wound; and which in the act of biting, being thus pressed upon, instantly ejects the poison.

Others are of the opinion, that there is a particular property in the eyes of these snakes, that on their fixing them on the eyes of any animal, or bird, that they are immediately fascinated or charmed, to their destruction. I have been lately informed by a learned friend, that it was the opinion of the late **PROFESSOR BARTON** of Philadelphia, that the supposed charm was to be accounted for upon other principles; that the squirrels and birds, having their nests of young in the forks of trees, and instinctively knowing the enmity between the snakes and themselves; and fearful, that their enemy might discover their nests, and thus destroy their young, become extremely agitated, and fly from side to side, but without leaving the immediate vicinity of their nests, in hopes of arresting the attention of the serpent, and drawing him off to another direction: but, that at length, being wearied out with fatigue they flutter and fall into his power, and are thus destroyed.

While I acknowledge the ingenuity of this supposition, I cannot assent to the principle, and I shall endeavour to account for this wonderful property in snakes, by producing a power somewhat analogous; together with the certain causes of that power in the uses to which it has been obviously applied:

The amazing powers of the *Gymnotus* or Guiana eel, otherwise called the *Torpedo*, as related by **DRS. GARDEN and PRIESTLY**, leaves us no room for doubt, but that they actually possess the power of shocking men at the distance of fifteen feet with a strong electric shock. And the former gentleman states, "that he was told that some of these fish or



eels in Surinam river, were upwards of twelve feet long, and that the stroke or shock of these produced *instant death*.

From certain experiments, in which I was engaged in the year 1790, on the *Guiana eel*, it was clearly proved, that the powers it possessed, were truly and positively electric. I received repeated shocks from it, some as high as the elbow, and with the same sensation as the shocks from an electric director. In forming the electric circle, with five or six persons, the shock passed through every individual at the same instant: on touching the eel with a metallic instrument held in the hand, the shock was so severe, as to stun for a moment: from these experiments I was convinced of the identity of this power, with that of the electric fluid.\*

The peculiar property, or electric power of the *Guiana eel*, may be very properly considered as appropriated to its defence; and also as a mean, in enabling it to provide sustenance: since, from all the effects that I have witnessed in its exercise of this power, they have invariably resulted in favor of the foregoing conclusion. Larger fishes, that might otherwise make a prey of these eels, are thus prevented from approaching near the limits of its influence; and are perhaps so stunned, as to incapacitate them from injuring these eels; while smaller fish are almost instantly killed by the slightest motion of the eel, and are thence drawn into their mouths for food, as I have witnessed many times, with the one before mentioned. and this I

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Since writing the above I have seen, that similar experiments have been made, and with the same results, by the celebrated DR. EWING of Pennsylvania. Ewing's natural philosophy page 69.

give as the *only known cause* sufficient to explain the phenomenon of this power in the eels.

And by parity of reasoning, I would attempt to prove the peculiar property, or powers of fascination, as it is called, of snakes, to consist of a certain effluvia, which it emits at pleasure, and which possesses the power of stupefying the smaller, and sometimes even the larger animals: the former of which especially becoming more and more intoxicated with the increasing effluvia, which the snake continues to emit, they are at length drawn into the vortex, or focus, of the attracting effluvia: whose soporific property depriving them at last of the power of escaping, they fall into the mouths of their devouring adversary.

I acknowledge that this is mere hypothesis; and as liable to be erroneous as either of the foregoing: but when we consider what has been already advanced with regard to their not wounding any animal or thing, designed for their food, I am encouraged to offer it as an opinion, that this power, termed fascinating, has been appropriated to snakes, as a mean for procuring them sustenance: and hence, I consider it as the *only known cause* sufficient to explain the phenomenon of that power.\*

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\* MAJOR ALEXANDER GARDEN, a distinguished member of the Literary and Philosophical Society of South-Carolina, a gentleman of deep research and of acknowledged talent; in a valuable paper on this subject, read before the historical society of New-York, in September last; has advanced an opinion that tends to the confirmation of this hypothesis.

## CHAP. II.

### OF INFECTIONS.

**B**EFORE I enter into the definition of the term *infection*; and the laws that especially distinguish them from contagions; both, as it regards their generation and communication, I shall attempt the explanation of an intermediate term, hèretofore indiscriminately applied to both; and by thus previously establishing the sense, in which these several terms are hereafter to be understood in this essay; prevent the necessity, of a needless repetition throughout.

*Miasma* is the Greek term for pollution, and hence, most Lexicographers; as also many distinguished practical writers, have applied it, to both contagions and infections. Thus, it is said “to denote that contagious effluvia of pestilential diseases, by which they are communicated to persons at a distance.”\* Again, it has been used to “distinguish between that contagion, which is confined to the effluvia from the human body, when subject to disease, yet this contagion when it does not proceed immediately from the body, but has been for some time confined in clothes, is sometimes styled *miasma*.”† DR. CULLEN says,‡ “we know with

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\* Encyclopediæ Britannica, Article Contagion,

† Americ. Med. Lex., Art Miasma.

‡ Practice of Physic. Par. LXXXIII.

certainly only one species of *miasma*, which can be considered as the cause of fever; and from the universality of this, it may be doubted if there be any other," and this *miasma* as arising "from marshes, or moist ground, acted upon by heat," is considered by him as *marsh effluvia*, to distinguish it from that, which arises from the human body in a diseased state; and which is, instead of *miasma*; properly termed *human effluvia*.

"Another kind of *miasma*," says the American Lexicographer "is putrid vegetable matter, and indeed every thing, of this kind which appears in the form of air. *Miasma*, then, strictly speaking is an *ærial fluid*, combined with atmospherical air, and not dangerous except the air be loaded with it."

With a view to render the distinction between contagions and infections less perplexing; and to affix to each of the terms used on these occasions, their several definite meanings and applications; I have prefixed the following *Aphorisms*.—

1. That particular exhalation from the bodies of diseased persons; by which the disease may be communicated to persons coming within the sphere of its influence; in consequence of an atmosphere generated by the particular morbid exhalation of the body thus diseased, is a *contagious miasma*.

2. The same exhalations; as also those fluids, or matters secreted by diseased bodies, and which have been imbibed in clothing, &c. and are thus capable of exciting and re-producing the same specific disease, with that by which it was produced; should, according to DR. CULLEN, be considered & called the *fomites of contagion*.\* as being

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\* Cullens Practice. Par. LXXXII.

produced by “living vascular and secretory action upon the fluids they convey.”

3. Those miasmas or exhalations, produced by the decomposition of *vegetable substances*, during their *putrefactive process*, should be distinguished as *septic miasma* formerly termed *hydro-genic or marsh miasma*, and which is the primary cause of fevers, not malignant, and but merely infectious, from an infected atmosphere, such are the diseases of the first class of infections.

4. Those, that are produced by a combination of the third and fifth, as *compound infections*. And as these partake of more or less of the *azotic miasma*, so will the modification of the diseases produced by them be more or less *malignant* and *vice versa*. These constitute the second class of infections.

5. Those *miasmas*, or exhalations, that are produced by the decomposition of *animal substances*, during their *putrefactive process*, should be termed as they properly are *azotic miasma*, and will be found to be the primary cause of malignant fevers, and hence constitute the third class of original and primary *infections*.

From these premises, I propose to draw the line of distinction between *contagions* and *infections* properly so called, and having, in the foregoing chapter, treated of the former, I shall now proceed to the consideration of the latter.

*Infections* are certain noxious effluvia, or *aerial fluids*, produced by the decomposition of either animal or vegetable substances, during their putrefactive process, or of both combined: as has been illustrated in the third, fourth and fifth aphorisms.



It will be readily perceived, that the distinction between contagions and infections, consists in the following particulars: The former, are the product of "certain morbid humours, or poisons, secreted from *organized living animal bodies*; and secondarily, by their *fomites*, or the matters of contagion, while the latter are universally the product of *dead animal or vegetable substances*; which, let loose certain particles or *aerial fluids*; while undergoing their putrid process, and being now attached to the atmospheric air, produces *infections* of various degrees of malignity, as noticed in the fourth aphorism.\*

It may be proper to observe in this place, that the *contagions* of the first and second aphorism, invariably produce diseases of specific characters, whether communicated by contact or their fomites, for example, the effluvia arising from the secretions, or from the excrementitious matters of a *small-pox* patient, will not produce *yellow fever*; but small pox. Neither will those of the *measles* produce *Chicken-pox*, but measles; So, neither will any of the original and primary infections, produce any or either of the contagious diseases; otherwise the doctrine of contagions, and their laws of generation and communication, by which they are governed, would be at an end.

That a disease originally and primarily *infectious*, may, by concentrated effluvia, or by some pe-

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\* *Van Morn* says the air found in sick chambers, is in part *Carbonic acid gas*, *azote*, *oxygen*, sometimes also *Ammoniacal gas*, and a peculiar emanation, which is the source of contagion. This seems to be a combination of *Hydrogen and carbonic acid gas*, holding in solution some part of the animal fluids. *DR. TROTTER* observes, that the smell of patients laboring under bad fevers, in the opinion of some, comes near to that of *sulphuretted hydrogen gas*.

culiar causes super-added, become *contagious*, I am ready to admit, and it is upon this principle, alone, that I have been at length induced to class the *plague* along with contagious diseases.—For it is an old and well supported opinion, that it is produced by the same laws of generation, as have been defined in the articles of infection; of which I shall proceed to say something, for the more perfect understanding of them; and having already defined their laws of generation, those of their communication will be now explained.—

The infection which has been marked, as originating from *effluvia* or *miasmata*, altogether vegetable, and constituting the *first class* of simple atmospherical infection, is productive only of that type of fever, termed an *intermittent*. The disease itself is not communicable by any of the laws that govern either contagions or infections; consequently, we do not mean the disease to be an infectious one; but that the air is so far infected, or polluted, as to be capable of exciting, in persons predisposed, a disease of that specific character, either in the form of a *quotidian*, a *tertian*, or *quartan*; but still retaining its type, as an intermittent.

It has been considered necessary to say thus much on the subject of intermittents, in order to prepare the mind for the gradations in the class of fevers; and by which the doctrine of infections is more clearly understood. It will be necessary therefore, to advert to the actual origin and progress of this, as well as of those fevers of the foregoing class; such as they have almost invariably occurred for centuries past; and from the facts resulting from this investigation; the doctrine of in-

fections, as distinct from contagions, will be clearly established.

In the interior of those countries where the population is thin, and the settlements scattered; there is but little animal putrefaction going on; and consequently, the atmospherical air, is seldom or never burdened with *Azotic miasma*. But in consequence of the numerous river-swamps, rice-fields mill-ponds and other stagnant waters, peculiar to low marshy countries, and the great mass of vegetable matters, that are annually deposited therein; the air is loaded with those exhalations, which the summer heat extracts from them, by which an *infectious atmosphere* is generated, that is capable of exciting disease of a specific character, and that, *ad infinitum*.

This infection as originating from *septic*, i. e. vegetable, or as it has been heretofore termed *marsh miasmata*, independent of *Azotic miasma*, or *animal effluvia*; is acknowledged on all hands,\* to be productive of fevers of the intermittent type; and this infection, by the accession of other noxious powers, produces fevers of the *remittent* or *continued* form, in some one or more of the modifications peculiar to them.

The progress of this fever is to be traced as follows:—The persons particularly exposed to the influence of this infection, are most commonly seized with an intermittent, sometime in August, or from that to November; and if there be no further accession of any noxious exciting power; it runs its course either as a *quotidian*, *tertian* or

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\* *Cullens Pract. Par.* LXXXIV. *Amer. Med. Lex.* Article *Miasma*. So also, *Bertholine Sylvius, Celsus, Prosper Alpinus* and others.



*quartan*, but always retaining its type of an intermittent. But if to this primary infection, there is super-added some other noxious power, or also, as is very frequently the case, the patient be particularly pre-disposed to disease, the infection or vegetable miasma, now acting upon a living animal body, some of whose secretions are noxious, that is, *Azotic*; the union or combination of the simple, original, and primary *gas* or effluvia, with the noxious matters of the system, approximates more and more to the second order of infections, and thus an original and primary *intermittent* is changed to a *remittent*, or else to a *continued fever*. And if to this, there be also present an excessive hot or excessive moist season; with little or no lightning & thunder, the fevers put on the nervous livery; and are then the *typhus mitior* of Dr. CULLEN.

That the foregoing doctrine is something more than a bare hypothesis; the experience of most, if not all practical writers will substantiate. For it is an incontrovertible fact, with regard to these fevers, *that in proportion, as the noxious matters which produce them, are lessened by the remedies, or means used for their expulsion, continued fevers are changed to remittents, and by the further expulsion of them, remittents are changed, or reduced to intermittents, or else the disease is altogether removed.*

There can be no doubt, that by an accumulation of *azotic miasma*, combined along with the *septic* as is invariably the case in large maritime cities, within and near the tropics, an *infection* of higher grade is produced, and which is capable of exciting disease of greater duration and violence; and this infection I term *compound*, as being formed of the

union or combination of the two gases or miasmas, and from which union a *specific gaseous poison* (perhaps *Ammoniacal gas*) is the result.

This infection, which I rank in the 2nd. class, is found to exist at all times, within the limits of large and populous towns, particularly maritime cities, as before mentioned; but is active only, under a particular constitution of the atmosphere;\* that is, in excessive hot or moist weather.—It is then capable of exciting actual disease; and more readily in strangers and children; than in adult natives. In common years, such as are not remarkable for an unusual degree of heat or moisture; and in which the air is kept elastic, by frequent concussions from thunder and lightning, the modification of disease commonly excited by this infection, is the common autumnal remittent; and in proportion as this disease has been excited, by an atmosphere more or less charged with the *gaseous poison*, or infection; and in proportion also, as the persons thus diseased, are more or less assimilated or naturalized to the climate; the disease is also more or less violent, and in its worst state, becomes what has been generally termed with us the *yellow fever*, the *typhus icterodes* of DR. CULLEN, or *Pestes occidentalis vel tropicum* of DR. HOSACK, and which I shall distinguish as the *typhus endemica* of South Carolina.

That modification of disease, heretofore termed the *bilious remittent fever*; will, I imagine, upon close inspection, prove to be nothing more than a symptom of the common autumnal remittent.

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\* See the Syllabus at the end of this chapter.

That a redundancy of bile, evacuated in this fever, constitutes a prominent symptom of it, is not doubted by any: but that the bile is an original, or exciting cause of the disease, is an opinion, which now has but few advocates left.

The law which governs the third class of infections, and which forms another distinguishing feature in the difference between them and contagions, is, that they are communicable "*only through the medium of an impure atmosphere*;" and then, very rarely to any, except persons particularly pre-disposed to disease. For, as *Professor Hosack* has observed\* "in a pure air, in large and well ventilated apartments, when the dress of the patients is frequently changed, all excrementitious discharges are immediately removed, and attention paid to cleanliness in general; these diseases are not communicated, or very rarely so, from one to another."

To this class of infections, I am disposed to refer those modifications of disease, that form the *typhus gravior* of *DR. CULLEN*. The fevers that have been variously termed *gaol, ship, hospital and camp fevers*; appear to me to be no other than the same fever, differently named, in consequence of originating either in crowded *gaols, ships, hospitals, &c.* In which situations the infection is more highly concentrated; and in which a proper regard to cleanliness, from particular circumstances, may be rendered impracticable. To this class, also, is referred one of the *profluxia* of *DR. CULLEN*, the *dysentery*, which, according to *DR. LIND*, almost always, either precedes, or else accompanies, or follows the fevers of this class; and generally the cli-

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\* Letter to Dr. Chisholm.

mates and circumstances that especially favor the generation of this type of fevers, are also favorable to the generation of dysentery; which is likewise more or less malignant, as the causes are more or less concentrated.

There is yet another disease, which does not come properly within the definition of either of the laws of generation, or communication, heretofore noticed: It is, notwithstanding, evidently produced by an infection of a very specific character,\* and as such establishes a *fourth class* in the genera of infections. This disease has been termed by some writers, *catarrhus contagiosa*, and by others *catarrhus epidemica*; it is undoubtedly, the widest spreading epidemic ever known; for as Drs. CULLEN and RUSH,† have observed, “it has seldom appeared in any part of a country, without appearing, successively, in every different part of it. Indeed, it has extended itself from Europe to America, North and South, including the Western Isles; and it is believed, that in the years 1789, and 1807, its influence was felt over the whole world.”

It is said also to be a disease *sui-generis*, and is capable of blending itself along with almost every previously existing state of disease, which thence assumes various types and modifications, being at one time a *synocha*, at another a *synochus* and at others a *typhus*: “It very readily passes,” says Dr. CULLEN, “into *pneumonia*, *peripneumonia*,

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\* Dr. HOSACK, classes it along with contagions, and Dr. BARDSLEY physician to the Manchester Infirmary, &c. in his account of the *epidemic catarrhal fever*, at Manchester, in 1802, also insists on its being an actual contagion; so also, does Mr. TOMLINSON, who asserts that it is *highly contagious*; see *London Medical and Phys. Journal*, vol. 9. p. 529-30.

† Cullens Par. MLXII.—Rush's Med. Observ. and Enq.

and *phthisis*," and hence we may account for its being at one time a *typhoide pneumonia* or cold plague, as it has been called; at another *malignant pleurisy*. Sometimes a *febris rheumatica* or true rheumatic fever;\* sometimes a *typhus petichiales* or spotted fever, at others a head pleurisy; and at other times in its original form, that of the *influenza*, or *catarrhus epidemica*.

Of the origin of this infection, I can say but little, with any certainty. But, that it is an universal one is past contradiction;† as it does not owe its origin to any of the laws generating contagions. That is, it does not depend on, "*the secretions of living animal bodies*," neither on *azotic miasmata*; it cannot be considered a contagion, and this is further proved from the circumstance of its extensive influence; which is exerted equally on the mountain, as in the valley, and with as great fatality in the interior of any country, as on the sea coasts. Nor, on the other hand, am I disposed to admit, that it is generated by marsh or *septic miasmata*, but would rather trace it to a more probable source.

I am, therefore, disposed to hazard the opinion, that it originates in an excess of the *electric fluid* super-oxygenizing the atmospheric air, and rendering it thus: too irritable for the healthy support of the system. It is thence too, very properly termed an *aerial or travelling infection*, the air alone being the medium of its communication, and that under all circumstances, whether pure or impure, summer or winter, and wet or dry.‡

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\* Hooper on an epidemic diseases of London.

† London Med and Phys. Journal.—Vol. IX. p. 531.

‡ Same, Vol. XI. p. 82.



This opinion will be found entitled to some weight, when it is considered that authors of the first eminence, acknowledge, that there does exist, at times, an inflammatory constitution of the atmosphere; and that under very different circumstances of the weather. I have no doubt but that this state of the atmosphere is to be attributed to the excessive, or defective degrees of electrical influence on it, producing either *sthenic* or *asthenic*, inflammation. For, says the learned BRYDGE,\* “when an equal quantity is diffused through the air, and over the face of the earth, every thing continues calm and quiet; but, if by any accident, one part of matter has acquired a greater quantity than another, the most dreadful consequences ensue, before the equilibrium can be restored.”

That one portion of the atmospherical air, sometimes possesses greater proportions of the electric fluid, than some other portions, is certain; and consequently one portion has it in excess, while the other portion is deficient, and the equilibrium in both is deranged; under these circumstances it is possible, that the particular infection of the *influenza* may originate in that portion, in excess; and thus exciting the *sthenic* state of disease, which is proper to it in its original form; but which in its progress, meeting with other previously existing diseases, unites itself to them, and becomes an *asthenia*, as in *typhoid pneumonia*, and *malignant pleurisy*. *Typhus pteichialis*, &c.

Having thus gone through the catalogue of diseases, that have been considered as *contagious and*

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\* Tour through Sicily and Malta, p. 98.

*infectious*. I shall, here, offer a brief review of the most prominent features of the foregoing chapters, and conclude this with a syllabus, from which may be formed a genera or classification of them, in the order they have been presented.

## SYLLABUS.

### *Distinguishing Characters.*

#### OF CONTAGIONS, AND OF INFECTIONS.

Contagions are to be distinguished from infections,	Infections are to be distinguished from contagions.
1. In being the product of LIVING ANIMAL BODIES.	1. In being the product of DEAD ORGANIZED BODIES animal or vegetable, or of both combined.
2. By being a secreted fluid, or other matter, capable of reproducing the same specific disease.	2. By being <i>arial fluids</i> or <i>gases</i> evolved or disengaged from the foregoing, during their decomposition.
3. In being communicable only by CONTACT, or by the close approach of persons; and by the absorption of the matter, or <i>fomites</i> of contagion.	3. And are in general only communicable through the medium of an impure Atmosphere; <i>i. e.</i> the atmosphere which supports them.
4. And that under all circumstances of the weather, whether a pure or impure Atmosphere, wet or dry, hot or cold, &c.	4. Or, they are the product of an inflammatory constitution of the atmosphere, and thence universal.

FROM all which it will appear, that the following facts may serve as data, that may lead to the establishment of a *doctrine of infections*, founded on *electrical or atmospherical influences*, as derived from the actual occurrence of those facts, together with the modifications of the prevailing diseases, obviously depending upon the peculiar states of the weather, and collected from the medical history

and annual meteorological observations for South Carolina; as conclusive evidence in support of this doctrine, which I have arranged as follows:—

1. *In excessive hot and dry summers*, in which, there is *much thunder and lightning*, the humidity of the atmosphere being dissipated, or rarified, by the *electrical influence purifying the air*. The atmosphere does not support the *gaseous poison*, in a degree of strength or activity capable of producing *yellow fever infection*. Hence the prevailing diseases of such seasons are almost invariably, common intermittents, mild intermittents, mild typhus (*typhus mitior*) with simple continued fevers.

2. *In excessive hot and dry summers*.—In which, there is *little or no thunder and lightning*. The influence of the *gaseous poison* and type or modification of prevailing diseases, depend wholly upon the greater or less degree of heat. If the heat exceed  $96^{\circ}$  in unusually dry seasons, the humidity of the atmosphere being dissipated by the excess of heat, the *gaseous poison* being deprived of its necessary quantity of *hydrogen* is not sufficiently active to excite *yellow fever*.\* But if the heat is below  $90^{\circ}$  the *infection* or *gaseous poison*, retaining its full

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\* It is acknowledged, that an excessive degree of heat without the existence of an *electric equilibrium*, may, and does sometimes, put a stop to the violence of infections and infectious diseases. But this does not go to disprove the foregoing statement of facts; that the active influence of the *gaseous poison*, depends on a particular, perhaps *specific degree of heat and moisture combined*; or of moisture alone, and in either case, that its active influence, is immediately arrested by *thunder and lightning*, cold or frost; to this effect DR. FRANKLIN, in a letter to his brother at *Burlington*, on his way from *Boston*, in the year 1741, when the yellow fever was prevailing with great violence at Philadelphia; observes, “*Last night we had a severe thunder gust here, (PHILADELPHIA) which lessened the violence of the fever to day, and I think you may now venture to return.*”—See O RUSH on the Yellow Fever of 1793, p. 134, &c.



proportion of *hydrogen* is then capable of exciting *sporadic* yellow fever, in proportion to the greater or less degree of heat, and the prevailing diseases of the season will be, obstinate remittents *synocha*, or continued fevers, *causus*, *typhus endemica*, &c.—The present year, 1818, is a proof of the foregoing observation, as we have had no epidemic yellow fever.

The present year 1818, has been excessively hot and dry; the thermometer has varied from 78° to 94° *Fahrenheit*, for the four months of June, July, August and September; there has been a fall of only 11 in. 0 gr.  $6\frac{1}{10}$ . of rain, and in three of those months we have had thunder and lightning, *twenty one days*; some of which concussions were very severe. The season has been uncommonly healthy, it is also remarkable, that in the meteorological table, of Philadelphia, for the year 1793.—There was but one shock of thunder noticed, during the whole summer season, *viz.* on the 6th, of July, and only fifteen days of rain from that to the 31st. of October; thermometer 67° to 91°.

3. *In excessive hot and moist summers*, in which there is, *little or no thunder and lightning*. The humidity of the atmosphere being increased, and there being little or no electrical influence present in the atmosphere; the *gaseous poison* is then capable of exciting its utmost influence, and the prevailing diseases, *typhus endemica*, and *gravior* are more extensive and more fatal than in other states of the weather, as occurred in the years 1732, 1739, 1745, 1748, 1793, 1799, 1809, and 1817.

4. *In excessive hot and moist summers*, in which there is *much thunder and lightning*. Although the extreme humidity of the atmosphere is favor-

able to the support of the *gaseous poison* or *yellows fever infection*. Still, in consequence of the existence of the *Electrical influence*, in sufficient quantity to purify the air.—The infection is prevented from the exercise of its influence on the animal health, as observed in my essay on the prevailing fever of 1817, pages 6, 15, 20, &c. And the diseases of such seasons, are generally mild intermittents, remittents and catarrhal fevers, &c. From which circumstances I have attempted the formation of the *following genera or classification of contagious and infectious diseases*.

# GENERA;

OR,

## *Classification of Contagions and Infections*

### Contagions.



#### CLASS I.

#### FIXED OR INDOLENT CONTAGIONS.

ORD: I. TUBERCULA.  
Gen. Elephantiasis.  
Spec. 1. Pramboesia.  
„ 2. Coco-bay.

ORD: II. SQUAME.  
Gen. 1. Lepra.  
Gen. 2. Psora, etc.

ORD: III. VITIA.  
Gen. Syphilis.  
Spec. 1. Chancre.

“ 2. Sibbens,  
“ 3. Laanda,

ORD: IV. SPASMI.  
Gen. Hydrophobia.  
Spec. a rabies.

### Infections.



#### CLASS. I.

#### SIMPLE ATMOSPHERICAL INFECTION.

*Or that which is the effect of an Atmosphere charged with simple SEPTIC MIASMA. (Vegetable effluvia.)*

ORD: I. INTERMITTENTES  
Gen. 1. Quotidiana.  
„ 2. Tertianæ.  
„ 3. Quartana.

ORD: II. REMITTENTES.  
Gen. Remittens.  
var. „ biliosa.

ORD: III. CONTINUE.  
Gen. 1. Synocha.  
var. a—Synochula.  
b—Synochoides.  
Gen. 2. Typhus vel. Synochus,  
Spec. „ mitior,

*Contagions.*

## ORD: V. PHLEGMASIÆ.

- Gen. 1. Urethritis.
- Gen. 2. Cynanche.
- Spec. „ maligna.
- Gen. 3. Pertussis.
- Gen: 4. Phthisis.
- Spec. Pulmonalis.



## ORD: VI. VESICULÆ.

- Gen. Vaccinia.

## CLASS. II.

## VOLATILE ACTIVE CONTAGIONS.



## ORD: I. PUSTULÆ.

- Gen. Variola.



## ORD: II. VESICULÆ.

- Gen. Varicella.



## ORD: III. EXANTHEMATA.

- Gen. 1. Pestis.
- Spec. „ Orientalis.
- Gen. 2 Rubeola.

*Infections.*

## CLASS II.

## COMPOUND INFECTION.

*Or that which is the effect of the SEPTIC MIASMA, combined with AZOTIC.*

## Continuation of ORD: III. Cl. I

- Gen. Typhus.

Spec. „ Endemica, vel Ictero-des, vel Pestis, Occidentalis.

## CLASS III.

## ORIGINAL AND PRIMARY INFECTION,

*Or that which is produced by AZOTIC MIASMA (animal effluvia.)*

## Continuation of ORD: III. Cl. I.

- Gen. I. Typhus.

Spec. gravior vel maligna.  
var. a—Gaol, b—Ship,  
c—Camp or Lake Fever.

- Gen. 2. Dysenteria.

## CLASS IV.

## GENERAL OR UNIVERSAL INFECTION.

*Or that which is produced by an inflammatory Constitution of the Atmosphere, without regard to either of the MIASMATA.*

## ORD: PHLEGMASIA.

- Gen. 1. Catarrhus.

Spec. „ epidemica.

- Gen. 2. Typhoide Pneumonia.

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Professor Hosack's Classification has been mostly adopted in the foregoing.

### CHAP. III.

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#### *Practical remarks and observations, on the origin of Contagions and Infections,*

**T**HERE is not, perhaps, a portion of the habitable globe, that has been cultivated by man; which has not been at one time or other, visited by contagions or infections. Some countries are remarkable for their particular contagions, that have almost invariably originated in them, insomuch as to cause them to be considered altogether national or indigenous.

When we consider the *leprosy* of the Arabians, the *frambæsia* of Africa; the *plague* of *Æthiopia*, and *Egypt*, and the *yellow fever*, of *America*, and that they have been distinguished for many ages, in those several parts of the world, to which they have been transmitted; by the same general character, and as **DR. CULLEN** observes, are found “to differ only in circumstances that may be imputed to season, climate, and other external causes, we are compelled to acknowledge their *specific characters*, and to admit the laws of their origin; as also the laws of communication, by which they are respectively governed, and conclude, that they are the effect of a morbid action of the system; or of the peculiar constitution of the atmosphere, which I term the *local peculiarity* of the place.

From the specific characters, and the established laws of the generation, and communication of contagions and infections, we are enabled to trace



them in some measure, to certain limits peculiar to each, particularly *contagions*; whose secreted matters are at once obvious, and hence capable of being analyzed; and although *infections* are *aerial fluids*, or gases; which, from their subtlety or volatility, are scarcely ever to be detected by observation, even with the most correct *eudiometer*; still, their existence, their properties, and their laws, have been proved by their influence and effects on the animal economy, insomuch as to justify the foregoing hypothesis; which at length becomes an established law.\*

The *plague*, which has been considered as the most malignant, and most extensively fatal pestilence, that ever occurred in the world, in form of disease, is proved, notwithstanding, to be confined to certain limits; that is, it is only contagious from actual *contact*, or by means of its *fomites*,† and “may be avoided by a few simple rules: These consist in keeping beyond the sphere of infection, or contact of any clothes that has been within the sphere,”‡ It is proved by innumerable testimonies, to originate from the same sources that produce other malignant fevers; and, but for the circumstance of its being communicated by inoculation, and also by means of its *fomites*; it, in other respects, would appear, to have been more properly classed along, with the *infections*.

\* Modern philosophy has amply proved, “every particle of matter to be enveloped in its own proper atmosphere; and that it is endued with the capacity of exerting or extending it, according to the particular circumstances in which it is situated. This capacity is called elasticity, and is prodigious in the air from state of matter.” And this is abundantly exemplified in the matters of contagion and the gaseous form of infections.

† Amer. Med. Lexicon Article, Miasma.

‡ *Thorntons Med. Extr.* vol. IV. p. 376.

The sources of all pestilential or malignant diseases, have been found to proceed from one or more of the following causes: ~~that~~ moisture, stagnant waters, animal or vegetable putrefaction, unwholesome air, food and drink. DR. THORNTON, in his medical extracts, observes that GALEN,\* considers putrid fevers to arise from the corruption of dead bodies after a battle; and this opinion appears to have been confirmed by all practical writers since. MR. FORESTUS,† says, for he was an eye witness to a distemper of this kind, which he calls a plague, being attended with buboes, and a high degree of contagion; and which he observes, was owing to the same cause, and CAPT. RILEY, in his narrative, says, that the late plague which broke out in the Moorish dominions originated from the putrefaction of the swarms of locusts, which had perished in the Atlantic ocean; and were afterwards cast on shore, all along the western coast, from Cape Spartel, to Mogadore.‡

DR. MEAD, in his mechanical account of poisons,§ says, “and here it may not be amiss to take notice, that all authors do agree, one great cause of *pestilential* distempers, especially in armies and camps, to be *dead bodies*, lying exposed and rotting in the open air.”

With regard to heat, or heat and moisture, with stagnant waters, being the cause of malignant and putrid fevers; we have independently of the historians of our times, only to turn to the pages of

\* Epit Galen de Feb. Differ lib i. chap IV.

† Observat. lib vi. obser. XXVI.

‡ Rileys Narrative, page 482.

§ Essay, V. page 178.

**DIODORUS SICULUS**,\* on the plague of *Syracuse*, or that of *Rome* by **LIVY**;† those of *Copenhagen* by **BARTHOLINE**,‡ that of *Leyden* by **SYLVIO**, (*de la Boe*)§ of *Italy*, by **CELSUS**,|| and to come nearer to the history of our own times; the remarks of **SIR JOHN PRINGLE**¶ **DR. LIND** on the diseases incidental to strangers, in hot climates. **DR. CHISOLM** on the *Boullam fever*, together with those of **DR. CHALMERS**, **HEWATT**, **LINING**, **HARRIS** and **RAMSAY**, all of whom, offered as a chain of testimonies; so strongly connected, that leaves us not the smallest doubt of their being the cause of those fevers above mentioned.

The testimonies in support of the opinion, that unwholesome food and water, are oft-times the cause of malignant fevers; are also, many and respectable. “**FORESTUS** imputes, the plague at *Delft* in the year 1557, to the eating of mouldy grain, that had been long kept up by the merchants, in the time of dearth, *a*” we are told, that the city of *Surat*, in the *East Indies*, is seldom or never free from the plague; the chief of the natives being *Banians*, who neither eat flesh nor drink wine, but live very poorly, upon herbs, rice, water, &c. This poor fare, together with the heat of the climate are considered as the cause of this fever *b*; we also find, from the reports of the boards of health in England, that “they all concur in ascribing this malignant and fatal distem-

\* Bibliothec Hist. 44, XII. cap XIV.

† Tit. Liv. Anno U. C. 291.

‡ Barthol. Hist. Anat. Kar. cent. II. Hist. LVI.

§ Prax. Med. approved tract, X.

|| De medicin, 461, cap. X.

¶ Med. Extracts, Vol. IV. p. 287.

*a* Diseases of the Army.

*b* Mead on Poisons, Essay V.

## CONTAGIONS AND INFECTIONS.

per, which exists among the forlorn and wretched poor, to nasty chambers, bedding and clothing, to *bad food*, septic air, &c.”\* and these, being sufficient to establish the doctrine of the origin of malignant and pestilential fevers; we will turn next to the considerations of those that are peculiar to certain situations in different parts of the world; and which are termed their proper *Endemics*.

That there are certain countries, to which certain specific diseases are peculiar, we have already seen; and that there are *certain sections* in every country throughout the world; in which also certain diseases occur annually, as the proper *endemics* of those sections, remain to be proved. I have already hinted towards a *local peculiarity*, by which I mean the establishment of a term, which embraces the situation, climate, and general constitution of the atmosphere, favorable to the origin and support of such diseases, independently; of the constitutions, habits, or manners of the inhabitants.

To establish the *local peculiarity* of these sections in the different parts of the world; it is only necessary to advert to those of any one country. For instance, the state of S. Carolina, as described by DR. RAMSAY.† Thus the diseases on the sea coast of any country, and particularly near the tropics, are materially different from those of the interior of the same country, (with the exception of contagious diseases, and some of the infections.) In the interior, we find the diseases milder than those of the sea coast, and those on the margins of swamps, canals, bays, ponds and other stagnant waters, are again different from those of the high

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\* Amer. Med. Lexicon, Article Pestilence,

† Vol. II. page 100.



sand ridges, or pine-barrens of the same district. As each of those sections enjoys an atmosphere peculiar to itself; it is obvious that in proportion to the greater or less accumulation of *Septic miasmata*, evolved or disengaged from the putrid matters of the place and mixing with the air, so will the disease excited, be of greater or less violence, and of longer or shorter duration. And this is what I conceive to be the *local peculiarity* of different sections of the same country.

Those fevers, that are the proper *endemics* of all low, flat, marshy countries; are observed to exist only, under certain circumstances, as it regards the season of the year, and the state of the weather. If the weather is mild, they arrive only to that height which is distinguished as the first class of infections.

But if the season is uncommonly hot, or wet, they almost invariably assume their highest grade, and are distinguished as the second class. Dr. LIND, whose interesting work, I have occasion frequently to refer to; remarks on the *yellow fever*, of the West Indies, “that heat, exercise, and intemperance in drinking, disposes to this fever in hot climates; but they do not produce it without the concurrence of a *remote cause*. This remote cause, exists at all times in *some parts* of the island; but, in *other parts* of the same islands, where there are no marsh exhalations, the disease is unknown;”<sup>\*</sup> again, “the most unhealthy spots in the world, have in their neighborhood, and often at no great distance from them, places which afford a secure retreat, and protection from disease and death; as has already appeared in part, but will be more fully

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\* Diseases Incidental, &c. p. 164.



proved in the sequel: In a word, the diseases most fatal to strangers in every country, seems not to be confined to particular seasons; but, even during those seasons, to certain places only.\*

"There is nothing," says Dr. RUSH, "in the air of the West Indies above other hot countries, which disposes it to produce *yellow fevers*; similar degrees of heat acting upon dead and moist vegetable matters, are capable of producing it, together with all its different modifications, in every part of the world."†

These *local peculiarities*, are especially to be observed, by a close attention to the different grades, as well as modifications of the disease, as it exists in a city. If it be yellow fever, (*typhus endemica*) we find, that while it assumes its highest grade in one part of the city, it will be found in other parts of the same city, less favorable to its existence, in no other form than that of a *common remittent*. If we trace the causes of this difference to their source, we find, that although the same degree of heat exists throughout the whole city; there is abundant more moisture in some other parts of it, as also dwellings indifferently ventilated damp vaults, cellars, &c. and that it is, in these situations, the fever originates; and that although sinks and drains are common to all the parts of the city, some are much more filthy, and emit an effluvia tenfold more offensive than others, and hence the air of these situations contain the noxious exciting power, or *gaseous poison*, in a more concentrated form than the air of those parts of the city that are higher, more dry and cleanly; whose buildings are more spacious and better ven-

\* Diseases Incidental, &c. p. 164.

† Med. Obs. and Enq. Vol. II. p. 199, 200.

tilated, and which are more remote from the streets of animal and vegetable commerce.

In taking a view of the effects of this *gaseous poison*, on the animal economy,\* I was imperceptibly led to speak of it as having been received directly into the stomach. I now take leave to rectify an error, which originated in a too rigid attention to its effects; while I measurably lost sight of the manner in which it was most probably introduced into the system.

Subsequent reflections, and a more minute attention to the subject, enables me, at this time, to offer a more probable medium of introduction, than either the stomach or the lungs. I am now decidedly of the opinion, that the *gaseous poison*, or yellow fever influence, insinuates itself *primarily* by the *olfactory nerves* to the brain; where, having produced a morbid excitement of the nerves; and becoming more and more diffused; it communicates in succession, its deleterious effects *secondarily* throughout the whole nervous system; and all the circulating fluids, producing the derangements which occasion the general and particular symptoms of the disease, as described in the 23d, and more particularly, the 27th page of the essay, on the fever of 1817. This mode of attack, and consequent effects, accounts for the disease putting on in most instances; first, the appearance of *sthenic inflammation*; which, shortly afterwards becoming *asthenic* is then no longer doubtful; but acknowledged as a legitimate *typhus*.

Great effects are very often produced from small causes, and when it is considered, that it requires the

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\* Essay on yellow fever of 1817. Chap. 2. p. 20.

conjoint aid of several causes, to produce *yellow fever*, as it is called; it is probable, that by proper attention to those causes respectively, or such of them as come within the control of man; we may in time be enabled to have a remedy equivalent to all. It will be observed, that each exciting cause; exercises a power peculiar to itself, and that several of these powers acting one upon another; at length produces the infection, as for instance :

If an acre of vegetable matters are cut down, and placed in such situation, that they may be speedily dried by the heat of the sun, the exhalations from those vegetables are extensively diffused in the air; and are not thus productive of an infection: but if this quantity of vegetable matter, is heaped in a body in its moist state, or is thrown into a shallow pond of water; they very soon begin to putrefy, and the effluvia which they emit being confined to a small space, is highly infectious; and capable of exciting a disease peculiar to its specific powers. Here, we perceive, that it requires the action of moisture, as well as of heat, to produce this particular *gas*; and which, without the addition of moisture, would be dissipated by the air as fast as it was discharged from the vegetables in their exsiccation.

I shall conclude this chapter, with quoting what has been said on the subject of pestilence in the *American Medical Lexicon*, by way of illustrating the foregoing remarks : “ An army or a city may be afflicted with pestilence, engendered from the nastiness of the inhabitants, accumulated in the receptacles of their offals and excrements, whether hid away in the rear of their lots, or left exposed in the streets and bye-places; a *gas* arises. from those foul and corrupted forms of matter, which contami-

nate the neighboring atmosphere, to the distance of perhaps a few feet, and perhaps, to an extent of many rods; and excites in those, who breathe it, more or less sickness."

"Also in private houses, pestilence may be produced, and sicken or destroy a single family, from some internal or local cause about the house, cellar, yard, or their appurtenances. But is not commonly called a pestilence, unless it cuts off a great number, at a time. A pestilence may arise from internal, as well as external causes; corrupting meat for example used as food, may be exceedingly noxious to the stomach and intestines of those who feed upon it, and cause dysenteries, fluxes, and various symptoms of febrile disease."

## CHAP. IV.

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*Hints towards the best means for preventing the spread of Contagious, and Infectious diseases.*

Previously to the advancement of the hints, on the means for preventing, the spread of these states of disease; it may be necessary to premise a few particulars; with regard to them:

First, although, we are constrained to acknowledge, that some of the *contagions*, and most, if not all the *infections*, originate from sources, beyond human control; yet, it is possible to prevent their worst effects, by means, that come within the reach of almost every individual.—

Secondly, that as they are known to exist, invariably, under certain occurring circumstances; and these circumstances always preceding some of the diseases; we are thereby favored with a foreknowledge; that may, if properly used, tend to the counteraction of the most dangerous effects of the *infection*.

Thirdly, as *infections* arise from a variety of causes, and each *infection* being capable of exciting a disease, peculiar to itself; it is reasonable to conclude, that the combination, of two or more, by forming a noxious power more concentrated, must be also capable of exciting a disease of greater violence, than any *single, simple and original infection*.

Lastly, by lessening the power of any one, or more of the causes, producing *infection*, the effect



of the remainders, will be lessened in a relative proportion, so that, the disease, when excited, will be less violent, and consequently, less fatal. For each *infection*, as we have already shewn, being limited by specific laws, are incapable of exerting their influence, beyond those limits; examples of which, will be given shortly, by way of illustration.—

The causes, that are productive of the highest class of *infection*, are found to consist of the following :—

1. *Animal Putrefaction*, or the decomposition of animal substances, whether in bodies of men, or of beasts, putrid flesh, or fish, or the offals of either; next to these, we may add the effluvia of sinks and drains.

2. *Vegetable Putrefaction*, these being specific, require no farther description.

3. *Heat*. A degree of heat equal to that of the healthy temperature of man; and even some degrees below it, is capable of generating, an infectious atmosphere, in all low marshy countries, by its action upon the superabundant humidity of the soil, and—

4. *Moisture*. All low, and marshy countries; presenting a surface, such as marks the first division, or *low country* of South-Carolina, “continually intersected by multitudes of swamps, bays, and low grounds, and having large reservoirs of water, and rice fields at particular times overflowed.”\* And these operated upon by the summer and autumnal heat, is another source from whence infection originates.—

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\* Drayton's View of South-Carolina, Page 17.

DR. RAMSAY, after having designated the *medical divisions* of South Carolina, as resulting from the natural qualities of the soil, informs us, that "art has done something, and might do much more for the improvement of the country. Every drop of superabounding and at present injurious moisture that is therein, may be turned to some useful account. *When suffered to stagnate, it is a curse; when properly dispersed it is a blessing.*"\* To the same purpose, have most authors devoted many pages of their valuable works, from a firm conviction, of the possibility of rendering the causes of disease less formidable, and thence, less fatal to the human family.

From a review of the distinct causes of *infections*, it will be readily perceived, that large populous cities, especially those of low marshy countries, possess certain peculiarities, which necessarily, and from the very nature of their constructions and purposes generate daily, a superabundance of noxious air; and which, with the assistance of heat and moisture at certain seasons, produces an *infection* of the second degree of violence; and to which if there be superadded a more highly concentrated effluvia, such as is generated in fields of battle, gaols, hospitals, ships or camps, greatly crowded, arises to the third or highest grade of malignity. These various causes, may be therefore considered as constituting a *local peculiarity* in each district, or section of country, differing in its *medical division* from another section, of the same country or district; and in which, there does not exist an atmosphere, capable of supporting the *infection*.

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\* History of South Carolina, Vol 11. Page 101.

These latter afford a secure retreat in the sickly seasons; and hence, the first obvious means of escaping the baneful effects of an infected atmosphere, is to remove from the sphere of its influence, to those sections, in which it does not, nor indeed cannot exist.

In common sea islands, that are not crowded with houses, the high ridges of lands; between the rivers, and remote from river-swamps, are generally healthy; while the inhabitants of cities, and settlers on the margins of swamps and bays are generally sickly; these also point to a *local peculiarity* as distinct from the former; and hence, the physicians of Charleston, generally recommend to strangers, and persons not assimilated to the climate, a removal to *Sullivan's Island*, during the fall months, and until frost.

The good effects resulting from a prompt attention to this judicious advice, has been very repeatedly, and recently, experienced by citizens and especially by strangers.

But there are many families as well as individuals, whose occupations in life, and whose pecuniary circumstances prevent them from a participation of the advantages arising from the above advice, consequently some other means must of necessity be resorted to in their behalf. Those most appropriate may be classed as follows:

They should, at all times, but especially during the sickly season, avoid excessive labor or fatigue of any kind; they should also avoid night air, and night watching. exposure to the heat of the sun, or the dews, rains or fogs of the season, intemperance in either food or drink, sudden changes of diet, and all convivial assemblies; for, as Dr. RUSH observes, "a plentiful meal and a few extra glasses of

wine, seldom failed of exciting the fever, but when the body was strongly impregnated with the contagion, even the smallest deviation from the customary stimulus of diet, in respect to quality or quantity, raised the contagion into action.”\*

Citizens, in whom the infection lies dormant until called into action by some other exciting cause, should ever, in those seasons, consider themselves predisposed to the disease; and although from their assimilation to the *local peculiarity* of the place; they are only predisposed to the disease in its common, or mild form, of a *remittent fever*; there are instances, in which, from irregularity in living, or inattention to the known rules for preserving health, citizens of long standing, have had this dormant infection roused into action, and thus exciting a disease of the highest grade. I have seen many instances, in which persons, who reside part of the year on their plantations, and part in the city, have fallen victims to the injudicious and rash practice, of visiting their plantations during the prevalence of the disease in the city, and often, only, by sleeping out of town, for *one or two nights*.

DR. LIND, very frequently, throughout his essay, remarks, that he has observed “persons who had quitted their vessels, while lying in the ports of unhealthy countries, and slept on shore, that they are almost invariably seized with the fatal diseases that prevailed in those countries; while those who remained on board, kept wholly free from any attack of disease.”† I am aware, that many persons will consider this latter precaution superfluous; but from a minute attention to the animal sys-

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\* Med. Obs. and Enquiry.

† Lind on the Diseases of Hot Climates, part II. page 170.

tem, and to the relative influence of *infections*, they will discover sufficient reasons, for being thus attentive to changes of situation, however trivial in their appearance.—

The absolute necessity of *a renewal of pure vital air, at every inspiration*, for the healthy support of the system, is too well known to need a more particular description. Persons, having breathed the air of any country, however unhealthy, for a period of ten years, may be considered as perfectly assimilated to the air of the climate; the system adapts itself readily to the changes, while those changes are slow, gradual and regular, and thus a native of *Finland*, by gradual assimilation, may become a healthy resident of *Africa* or the *Indies*.

But, if during the prevalence of a disease from an infectious atmosphere, and to which the citizens resident have been naturalizing themselves for a given time, change from the local peculiarity of the place, to that of another less noxious, say for one night only, it must be obvious, that they will have exhaled or discharged the noxious air, and inhaled the purer air of the place in its stead: and now, after having taken in a full portion of this air, they again return to that which is *infected*; the consequence will be, that as they again discharge the air of the former situation, they receive an entire supply of the *infected atmosphere*; and in point of predisposition to disease, are placed upon a parallel with strangers.

Citizens, as well as strangers, may be convinced of this predisposition to contract the prevailing disease by one or more of the following symptoms: an unusual flow of spirits, together with an increase of strength and vigour, without any obvious cause;



or a depression of the spirits, with evident weakness; frequent yawning and gaping, sneezing and stretching the arms; an anxiety, uneasiness and restlessness; head-ache, with pain in one or both eyes: sometimes the latter are watery, and the whites discoloured, either pink or red; warm flushes, and cold chills, alternately come over them; and to use the patients' own words, the latter resembles a current of cold air, or water, rushing through their bodies, particularly along the spine. In some, there is nausea, with reaching to vomit, the tongue coated with white or ash coloured matters, inclining to yellow or brown; in some, there is a loss of appetite and loathing of food; while in others the appetite is greatly increased; in all, there appears to be a preternatural thirst, and a great desire to indulge, in more than ordinary, of cooling acid drinks, and in most, there is an evident increase of the arterial action.

**DR. RUSH**, in his account of the yellow fever, of 1793, at Philadelphia, says "it has been observed in the southern states of America, that in those seasons in which the common bilious fever is epidemic "no body is quite well" and that what are called in those states "inward fevers," are universal." Page 83.

With such predisposition, it requires but little additional excitement to produce disease. A single act of intemperance, or a slight departure from the common line of health, will frequently rouse the dormant power of the *infection*, into actual disease; while, on the other hand, a strict attention to the cardinal rules for preserving health, with one or two doses of simple medicine; has, in hundreds of instances, not only prevented the forming state

of the disease: but has, also, removed every symptom of the predisposition.—

Independent of my regular practice, in the season of 1817. I prescribed for upwards of one hundred and fifty persons, who laboured under a marked predisposition to the disease; and who called, on me, at my several hours of meal, throughout the sickly season. To many of these I distributed not more than four doses of medicine; and to many others, but a single dose; and as far as I have been able to trace those persons, I have not ascertained a single instance, in which they had occasion to use more, than that already mentioned, as having been prescribed for them, by way of prevention.—

I have heard it observed, that it is a dangerous practice, to disturb the bile at this season of the year; and that by taking nauseating medicine, the bile is actually disturbed, and the person is then more liable to be attacked with fever than before.

To this opinion, I perfectly assent, upon certain conditions.—If the patient is a citizen of long standing, is labouring under nausea, retching, &c. I always conceive it necessary to prescribe a cathartic, along with three or four grains of tartar emetic, that is, if nothing contradicts the use of the latter.—If a stranger labours under the same predisposition, I prescribe the same medicine; but if the disease is actually formed: or if not actually formed, there is, nausea, or indications that the bile will be a troublesome symptom, either of the predisposition or of the disease—I conclude, also, that it were best not to disturb it; or at least, not until it became a symptom of the disease; but I have ever found it an important point, to keep the bile in subjection, and

the bowels perfectly soluble; whether the patient be actually diseased, or only predisposed. And the manner of effecting this, is within the knowledge of every rational man.

Having hinted thus much to individuals, towards the means of prevention; I shall next take leave, respectfully, to suggest such, as come more immediately within the province of the *city police and board of health*: previously to which, I shall offer a brief view of the influence of *infections* in cities and countries; and the means by which they are accumulated, supported and concentrated; as they have occurred to my mind, from a close investigation of their origin and powers for many years.

In the interior, where the sources of infection are merely *heat, moisture and vegetable putrefaction*, the sickly months set in as early as June, for the wide and extensive surface of humidity, acted upon by the intense rays of the summer sun; this surface, covered with the decaying leaves of the forests, and the herbage of the low grounds, the atmosphere becomes saturated with this *simple infection*, and *intermittent fevers* are invariably excited: \* here, however, they have to contend with a simple and solitary infection; for the exciting cause is of a general character; it is wholly and entirely *vegetable miasmata*; (*septon*) and independent of *human effluvia*; (*azote*) and the influence of this *infection* may be readily conceived, by throwing a stone into a smooth pond of water, and conceiving the

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\* I have been informed, that a learned Practitioner ~~in~~ the north, suggested the idea, that intermittents originated from wet or damp feet and ancles; that on instituting an enquiry, it was found, that among those persons, who wore worsted stockings, and leather boots, summer and winter, there had not been known an instance of this fever for several years.

stone to be the centre of influence, and each circle that is formed by the shock of the stone on the surface of the water, becomes less and less, as they extend farther from the centre; till its influence is no longer seen—such indeed, are the limits of all the infections, though some, are more extensive than some others, as will be shewn.

But in cities, we have sources of infection almost numberless; to the heat and moisture, we have, it is true, less vegetable; but infinitely more animal effluvia; we have it in all its stages; green, ripe and rotten. If we compare the atmosphere of the city to a smooth pond of water, and every cause capable of exciting an infection to as many stones, we may conceive a resemblance of the mixed or compound infection, by a handful of these stones, thrown at the same time, and at small distances from each other, into the pond, there would indeed be circles proper to each distinct stone, and these circles running into each other, will form an unequal and irregular circle to the whole; and this may serve to represent the difference between the first class of original and primary infection of the country, to the compound infection of the city; or the more concentrated form of infection of camps, gaols, hospitals, ships, and other crowded and uncleanly situations, in all parts of the world.

Among the multiplied causes of infection in cities, it must be admitted, that the innumerable sinks and drains, if not the primary, are assuredly, the secondary causes, and qualify the atmosphere to support, for a much longer time, than it otherwise would, the stamina of the infection, by communicating almost hourly, fresh supplies of their effluvia: and that this is the case, may be readily per-



ceived, when we take notice, that the infection, which is productive of the peculiar disease of the city, does not extend its influence to more than half a mile without its limits. The drains, it must be acknowledged, were sunk through the city, to prevent the accumulation of moisture, and other exciting causes of disease; and as long as they are kept clean, answer a very valuable purpose: that they are otherwise than clean, especially during the sickly season, is not to be attributed to the neglect of our police; who are indefatigable in their exertions, and in the performance of their duties; but to the thoughtless and lazy individuals, who wink at the duplicity of their servants, and others, that are in the filthy habit of secretly depositing the offals of fish, fowl and the smaller animals, into the drains, and sometimes into their sinks or sewers.—

I am perfectly satisfied, that on this subject I am not alone; many citizens, particularly those that have been observant of the state of the city, at different seasons of the year, have frequently, and especially in the latter parts of the evening, on passing certain drains, been almost overwhelmed with the stench, that has issued forth from their grates; this circumstance has frequently occurred, in particular sections of the city—particularly from church street to the bay; with the intersecting alleys; and I am warranted in saying, that in nine seasons of ten, the prevailing fever has originated within the limits of that section of the city.

From the beginning of June, in every year, and until frost, a daily inspection of the ware-houses, stores and cellars, in which are deposited grain, or vegetables of any kind, should be rigidly attended



to; and all matters capable of generating, or sustaining the *infection*, should be removed. For we have respectable authority to support our opinion, that apparently trifling causes, have led to the most serious and extensive fatality in cities. DR. ROGERS relates an instance of a malignant fever, occasioned by *the effluvia of putrid cabbages*.\* DR. RUSH, traced the origin of the most fatal disease, that ever afflicted the inhabitants of Philadelphia, the yellow-fever of 1793, to a cargo of *damaged coffee*, thrown upon the wharf.† And, in a communication to the public, on this subject, says, “it is no new thing for the effluvia of *putrid vegetables* to produce malignant fevers; cabbages, onions, black pepper, and even the mild potatoe, when in a state of *putrefaction*, have all been the remote causes of malignant fevers.”

Owners of wharves, and lots of low ground, in the city, should be prohibited from raising mud to fill up their wharves, during any of the summer months; but more especially, those persons who are in the habit of filling up low lots, with filth and rubbish, collected in the yards and streets of the city. It is also a matter of notoriety, that the scavengers carts, convey, daily, to particular low spots in the city, but more generally the skirts thereof, promiscuous heaps of dead animal and vegetable matters, which being deposited in heaps, become sources of infection, and greatly add to the general exciting cause of disease.—

In directing the attention of the police, to the importance of filling up all low lands, within the limits of the city, it is obvious, that dry and whole-

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\* Rogers on Epidemic diseases, p. 41.

† Medical Obs. and Enq.

some materials are intended, and not the rakings and scrapings of the streets and yards. I would suggest the immense advantage, of encouraging vessels to bring in dry sand and gravel as ballast, which might be purchased for the purpose of filling up all those situations, heretofore the sources of *infection*, near the bay: and, with regard to the trash of the streets, I would advise the selection of several high sandy eminences in or near the city; in which large pits should be dug, at least twenty feet square, and five or six deep; the dry sand and earth, from these pits, should be conveyed to those parts of the city, which require filling up, and the filth and rubbish of the streets, conveyed to these pits, and these, when filled, to within three feet of the surface, should be covered over with the remaining sound earth, originally thrown out of them. It may, indeed, be argued, that this would be attended with immense trouble and expence; but if the life of one individual should be saved by it, it would be more than equivalent.

I come next to speak of the means, which have been found successful in preventing the spread of both contagions and infections. And these are:

1. *Cleanliness*. It is unnecessary for the public authority to recommend; unless the individuals, composing a community, comply with the recommendation; clean streets, indeed, may tend to lessen the influence of *general infection*; but while individuals, neglectful of the common interests of the community, suffer their enclosures to abound with filth, or their common receptacles to remain unneutralized, *infection* will continue to exist, and its effects to be felt by many. By cleanliness, I would be understood, that, not only the streets and

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drains should be kept clean, but also, the enclosures of individuals; and their houses, sinks and cellars. By the neglect of one individual, on these points, thousands may become the victims of disease and death. A quantity of damaged coffee, thrown on a wharf in Philadelphia, in 1793, together with the effluvia of damaged hides, and other putrid animal substances, has been assigned as the source of an infection, which swept out, in the short space of one hundred days, four thousand of the inhabitants.\*

2. *Neutralization.* Infections being considered as *acids*; the practice of strewing *alkaline substances* over suspicious matters, has been attended with happy effects. The white washing of houses with lime; and the sprinkling unslaked lime into sinks and sewers, previous to, and during the prevalence of disease, is an important practice, and ought not to be neglected. All low spots ought to be drained, and their surfaces covered with lime, or ashes; or, at least, with dry sand.

For my own part, I am disposed to believe, that a prompt attention to the foregoing particulars, are among the most important, that comes within the reach of man; as the means of prevention, I will, however, add a third, that appears still to have weight with some writers, I mean.

3. *Fumigation*; the various fumes of *muriatic*, *nitric* and *sulphuric acids* of *brimstone*, *tar*, &c. have been extolled by different authors: but we are informed by DR. TROTTER, physician to the fleet of England, and DR. MITCHILL of the University of New York, "that nothing was effected or

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\* Mr. Carey's Account of the Fever of Philadelphia.

accomplished, by the experiments, made with these acids, which evacuation of the infected places, ventilation, careful scrubbing with soap and water, and lime washing the walls, would not have effected equally well, if not better.\*" There are however, certain advantages to be derived in *infected apartments*; both to the sick, and the attendants, by a most rigid attention to cleanliness, removing the bed vessels immediately, by sprinkling the floor with vinegar, and the bed clothes with camphorated vinegar; also, sprinkling vinegar on hot bricks, and burning sugar, with aromatic herbs, on a chafing dish.

Fumigations, with the *muriatric* and *sulphuric acids*, have been strongly recommended by that very able chemist, GUYTON DE MORVEAU. He put into a chafing dish, covered with fine charcoal, a tubulated retort of green glass, filled with nine ounces of *muriate of soda*, or common salt, slightly moistened, with half an ounce, or a little more of water: the fire being lighted, four ounces of *sulphuric acid*, was poured on the diluted marine acid; the *muriatric acid gas* was immediately disengaged, and this, uniting with the *ammoniacal gas* of putrefaction, neutralizes it, prevents its injurious quality, and removes at the same time, all its loathsome fetor."†

In the above proportions, however, the gas arising therefrom, would be too powerful for the respiration of the sick; and with this consideration, the *Medical Society of Charleston*, very judiciously recommended to the citizens, a more simple and

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\* Amer. Med. Lexicon; also Domestic Encyclop. art. *Contagions*.

† Thornton's Med. Ext. Vol. IV, p. 387.

safe, and at the same time equally efficacious process, for obtaining this *gas*, in sufficient quantity to their dwellings, or sick chambers; which, as high as I can recollect, was to place a saucer, with about a table spoonful of common salt (muriate of soda) on a few coals, and then slowly, and gradually, to drop on the salt, about half a drachm, or a tea-spoonful of (*sulphuric acid*) oil of vitriol; at the same time, avoiding the fumes, while they were arising. The experiments which DR. CARMICHAEL SMYTH, F. R. S. made with the vapours of different mineral acids, for the preventing and destroying contagion: is certainly entitled to credit. These experiments resulted, in a preference to the vapours, from *nitrous acid*; arising from the decomposition of nitre, or salt petre, by the *sulphuric acid*, or oil of vitriol; which may be prepared in the same proportions, and manner of the foregoing.—To obtain any thing like an effectual advantage; these experiments should be general, each house-holder, by a proper and simultaneous attempt, producing this vapour throughout the city; the infectious quality of the atmospherical air, may be so neutralized, as to arrest the further progress of the disease, for the season. It is of but small importance, that a family here, and another there, in different sections of the city, prepare these vapours, while ninety nine families of the hundred, neglect it. The thing to do good, should be general; the expence is indeed of so trifling a nature, that it is placed within the power of almost every house-keeper, to comply with it.

Fumigations with brimstone, cannot be attempted, in situations occupied by sick, or other persons; they are strongly recommended by DR. LIND,



for infected houses, hospitals, and other places, that have been evacuated by the inhabitants; with a view to destroy the contagion that may remain in them. The burning of tar, and firing of guns, have been strongly recommended by many; and I confess I was among the number. I have since seen, that kindling large fires, and firing guns, were resorted to in Philadelphia in the fever of 1793, but, it does not appear to have had the desired effect. And Dr. CHISHOLM, tells us that "the smell of smoke coal and tar, which is commonly pungent and penetrating, had no effect as a preventive; for, the *Hope*, of London, careening in an infected port, and having her bottom paid with this bitumen, received the infection as extensively as the others."\* Dr. RAMSAY attributes the spread of the *Small Pox* in this city, in the year 1760, to the smoking of the house, in which it originated; the smoke being carried by an easterly wind, propagated the disease, extensively westward, in the line of the smoke.†

When these facts are taken into consideration together with the apathy that generally exists among those, who are not the immediate sufferers by these calamities; conceiving, each for themselves, that it is time enough, to use means of prevention, when the *infection* enters their own dwelling, the experiments are neglected, or delayed until the *infection* becomes general, and then, the means advised for prevention, are considered, either as inefficient, or that it is too late, to answer the end. We have a proof of this apathy, in vaccina-

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\* Med. Ext. Vol. IV, Page 269.

† History of South-Carolina, Vol. II. Page 73.

inoculation—How many are there, who still reject this certain preventive of small-pox?—I refer for answer, to the numbers afflicted with that dread disease, during the year 1816—17.

Having discharged, what I consider my duty, in first defining what *contagions* and *infections* are; the laws, by which they are governed; and the limits of their influence: As also such hints for the use of the most probable means for preventing their most fatal spread amongst us. I must conclude this essay, with the sincere hope, that it may awaken the attention of each class of our citizens, to the adoption of those most likely to arrest the progress of them, by a general exertion, in the commencement of the sickly season: and also induce some person of greater leisure, and better qualification, to devise some more effectual means of prevention, upon principles, such as are suggested, in the *Medical History of South-Carolina*, by the late **DR. DAVID RAMSAY**.







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